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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/998,676	11/29/2001	Eric Wu	NA01-002	7361

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EXAMINER	
PHAM, TUAN	

ART UNIT	PAPER NUMBER
2618	

DATE MAILED: 04/26/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/998,676	WU ET AL.	
	Examiner	Art Unit	
	TUAN A. PHAM	2618	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *01 March 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-27* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-27* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 03/01/2006 has been entered.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. **Claims 1-4, 6, 8-9, 19- 23, 25, and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zinn (Pub. No.: US 2003/0064684) in view of Melanson**

(U.S. Patent No.: 7,010,271), and further in view of Palmer et al. (U.S. Patent No.: 6,038,255, hereinafter, "Palmer").

Regarding claims 1 and 20, Zinn teaches a method and a wireless audio transmission and reception system comprising:

an up-converter in communication with the pulse width amplifier (i.e., comparator) to receive the pulse width modulated signal and convert the pulse width modulated signal to a modulated carrier signal (i.e., frequency modulation signal)(see figure 3, transmitter 164 included mixer or up-converter, col.2, [0026]);

a transmitter in communication with the modulated carrier signal to transfer the modulated carrier signal wirelessly (see col.2, [0026]); and

an integrator in communication with the down-converter to receive the extracted pulse width modulated signal to remove a timing signal from said extracted pulse width modulated signal to restore the audio signal (see figure 6, integrator 222, col.3, [0032], integrator to filter out or remove a timing signal such as triangle wave signal with the input signal Vin to reform or restore the Vin signal).

It should be noticed that Zinn fails to teach an input audio signal and a reference control ramp signal to compare said a voltage level of said audio signal with said reference control ramp signal to generate a digital output signal such that a pulse width of said digital output signal is modulated by said audio signal, such that the pulse width is proportional to an amplitude of said voltage level of said audio signal to provide a pulse width modulated signal. However, Melanson teaches an input audio signal (see figure 2, audio in) and a reference control ramp signal (read on low frequency clock

square wave) to compare said a voltage level of said audio signal with said reference control ramp signal to generate a digital output signal such that a pulse width of said digital output signal is modulated by said audio signal (see figure 2, the PWM 204 receives the audio in and low frequency clock square wave and compare the two signal and produce the digital pulse width signal, col.3, ln.48-67, col.4, ln.1-15), such that the pulse width is proportional to an amplitude of said voltage level of said audio signal to provide a pulse width modulated signal (see col.4, ln.1-15).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Melanson into view of Zinn, in order to reduce heat dissipation and component size minimization in the design as suggested by Melanson at column 1, lines 53-60.

Zinn and Melanson, in combination, fails to teach a receiver to receive the modulated carrier signal, and a down-converter in communication with the receiver to receive the modulated carrier signal and-combine said modulated carrier signal with a receiver local oscillator frequency signal to extract the pulse width modulated signal from the modulated carrier signal. However, Palmer teaches a receiver to receive the modulated carrier signal (see figure 2, receiver 10, col.4, ln.12-27), and a down-converter (see figure 2, mixer 18, col.4, ln.12-27) in communication with the receiver to receive the modulated carrier signal and-combine said modulated carrier signal with a receiver local oscillator frequency signal (see figure 2, LO reference signal 19) to extract the pulse width modulated signal from the modulated carrier signal (see figure 2, demodulator, col.4, ln.12-27).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Palmer into view of Zinn and Melanson, in order to reduce heat dissipation and component size minimization in the design as suggested by Melanson at column 1, lines 53-60.

Regarding claims 2 and 21, Melanson further teaches the pulse width amplifier power amplifier in communication with the integrator to receive the audio signal and amplify said audio signal and transfer said amplified audio signal to a transducer (see figure 1, PA 114, col.2, ln.58-64).

Regarding claims 3 and 22, after combine Zinn and Melanson that both references will teach the claims invention. Zinn teaches a triangular wave form (see [0024]) and Melanson teaches comparator having a first input to receive the audio signal and a second input to receive the reference control ramp signal, said reference control ramp signal having a square wave form such that, as said comparator compares the audio signal and reference control ramp signal, the pulse width modulated signal is provided to an output of said comparator (see figure 2, audio in, low clock frequency square wave, PWM 204, col.3, ln.47-67).

Regarding claims 4 and 23, Zinn further teaches the method and the up-converter comprises a modulation apparatus to combine a carrier frequency with the pulse width modulated signal to form the modulated carrier signal (see figure 3, transmitter 164 comprises a mixer for mixing the pulse width modulated signal with reference frequency which generated by local oscillator, col.2, [0026]).

Regarding claim 6, Zinn further teaches the down-converter comprises a demodulation apparatus to extract the pulse width modulated signal from the modulated carrier signal (see figure 6, col.3, [0032]).

Regarding claim 8, Melanson further teaches the low pass filter having a cut off frequency suitable to pass the audio signal and remove the timing signal (see figure 2, LPF 203, col.4, ln.10-15).

Regarding claims 9, 19, and 27, Melanson further teaches the carrier frequency is at least 900 MHz (see col.3, ln.1-10).

Regarding claim 25, Palmer further teaches the down-converting said modulated carrier signal to restore the pulse width modulated signal comprises the step of: combining a receiver local oscillator frequency signal with the modulated carrier signal to restore the pulse width modulated signal (see figure 2, mixer 18, col.4, ln.12-27, LO 19, demodulator 22).

4. Claims 10-12, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zinn (Pub. No.: US 2003/0064684) in view of Melanson (U.S. Patent No.: 7,010,271).

Regarding claim 10, Zinn teaches a wireless audio transmitter system comprising:

an up-converter in communication with the pulse width amplifier (i.e., comparator) to receive the pulse width modulated signal and convert the pulse width modulated signal to a modulated carrier signal (i.e., frequency modulation signal)(see figure 3, transmitter 164 included mixer or up-converter, col.2, [0026]);

a transmitter in communication with the modulated carrier signal to transfer the modulated carrier signal wirelessly (see col.2, [0026]); and

It should be noticed that Zinn fails to teach an input audio signal and a reference control ramp signal to compare said a voltage level of said audio signal with said reference control ramp signal to generate a digital output signal such that a pulse width of said digital output signal is modulated by said audio signal, such that the pulse width is proportional to an amplitude of said voltage level of said audio signal to provide a pulse width modulated signal. However, Melanson teaches an input audio signal (see figure 2, audio in) and a reference control ramp signal (read on low frequency clock square wave) to compare said a voltage level of said audio signal with said reference control ramp signal to generate a digital output signal such that a pulse width of said digital output signal is modulated by said audio signal (see figure 2, the PWM 204 receives the audio in and low frequency clock square wave and compare the two signal and produce the digital pulse width signal, col.3, ln.48-67, col.4, ln.1-15), such that the pulse width is proportional to an amplitude of said voltage level of said audio signal to provide a pulse width modulated signal (see col.4, ln.1-15).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Melanson into view of Zinn, in order to reduce heat dissipation and component size minimization in the design as suggested by Melanson at column 1, lines 53-60.

Regarding claim 11, after combine Zinn and Melanson that both references will teaches the claimed invention. Zinn teaches a triangular wave form (see [0024]) and

Melanson teaches comparator having a first input to receive the audio signal and a second input to receive the reference control ramp signal, said reference control ramp signal having a square wave form such that, as said comparator compares the audio signal and reference control ramp signal, the pulse width modulated signal is provided to an output of said comparator (see figure 2, audio in, low clock frequency square wave, PWM 204, col.3, ln.47-67).

Regarding claim 12, Zinn further teaches the up-converter comprises a modulation apparatus to combine a carrier frequency with the pulse width modulated signal to form the modulated carrier signal (see figure 3, transmitter 164 comprises a mixer for mixing the pulse width modulated signal with reference frequency which generated by local oscillator, col.2, [0026]).

Regarding claim 14, Melanson further teaches the carrier frequency is at least 900 MHz (see col.3, ln.1-10).

5. Claims 15-16, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zinn (Pub. No.: US 2003/0064684) in view of Palmer et al. (U.S. Patent No.: 6,038,255, hereinafter, "Palmer").

Regarding claim 15, Zinn teaches a wireless audio receiver system comprising:

an integrator in communication with the down-converter to receive the extracted pulse width modulated signal to remove a timing signal from said extracted pulse width modulated signal to restore the audio signal (see figure 6, integrator 222, col.3, [0032], integrator to filter out or remove a timing signal such as triangle wave signal with the input signal Vin to reform or restore the Vin signal).

It should be noticed that Zinn fails to teach a receiver to receive the modulated carrier signal, and a down-converter in communication with the receiver to receive the modulated carrier signal and-combine said modulated carrier signal with a receiver local oscillator frequency signal to extract the pulse width modulated signal from the modulated carrier signal. However, Palmer teaches a receiver to receive the modulated carrier signal (see figure 2, receiver 10, col.4, ln.12-27), and a down-converter (see figure 2, mixer 18, col.4, ln.12-27) in communication with the receiver to receive the modulated carrier signal and-combine said modulated carrier signal with a receiver local oscillator frequency signal (see figure 2, LO reference signal 19) to extract the pulse width modulated signal from the modulated carrier signal (see figure 2, demodulator, col.4, ln.12-27).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Palmer into view of Zinn, in order to improve detection of a pulse width modulated signal in the receiver as suggested by Palmer at column 3, lines 32-40.

Regarding claim 16, Zinn further teaches the down-converter comprises a demodulation apparatus to extract the pulse width modulated signal from the modulated carrier signal (see figure 6, mixer 240, col.3, [0032]).

Regarding claim 18, Zinn further teaches the integrator is a low pass filter having a cut off frequency suitable to pass the audio signal and remove the timing signal (see figure 6, integrator 222, col.3, [0032], e.g., the integrator can be a low pass

filter to filter out the reference voltage signal, such as a triangle wave signal to reform the original audio analog signal).

6. **Claims 5, 7, 13, 17, 24, and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zinn (Pub. No.: US 2003/0064684) in view of Melanson (U.S. Patent No.: 7,010,271), and further in view of Palmer et al. (U.S. Patent No.: 6,038,255, hereinafter, "Palmer") as applied to claims 1, 10, 15, and 20 above, and further in view of Shamlou et al. (U.S. Patent No.: 6,690,949, hereinafter, "Shamlou").**

Regarding claims 5, 7, 13, 24, and 26, Zinn, Melanson, and Palmer, in combination, fails to teach modulation and demodulation apparatus is selected from a group of modulation apparatus consisting quadrature phase shift keying modulation apparatus. However, Shamlou teaches such features (see figure 1, modulator 16, col.4, ln.60-65).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Shamlou into view of Zinn, Melanson, and Palmer, in order to alternate modulation scheme for digital transmission in wireless system.

Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tuan A. Pham whose telephone number is (571) 272-8097. The examiner can normally be reached on Monday through Friday, 8:30 AM-5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Anderson can be reached on (571) 272-4177. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have question on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Art Unit 2618
April 21, 2006
Examiner

Matthew Anderson
Supervisory Patent Examiner
Technology Center 2600

Tuan Pham